Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Original) In a distributed processing system comprising processor nodes coupled by a multi-drop bus network, a method for isolating failures, comprising the steps of:

at least a plurality of said processor nodes each having information of relative locations of said processor nodes on said multi-drop bus network;

said plurality of processor nodes each independently testing access to at least one other of said processor nodes on said multi-drop bus network;

upon said access testing by any of said plurality of testing processor nodes detecting a failure to access at least one of said other said processor nodes, said failure detecting processor node determining, from said information of relative locations, the processor node having failed access which is closest to said failure detecting processor node; and

said failure detecting processor node storing an identification of said closest processor node having failed access.

2. (Previously Amended) The method of Claim 1, additionally comprising the step of:

posting an identifier of said closest processor node having failed access at an associated error indicator local to said failure detecting processor node.

3. (Original) The method of Claim 2, additionally comprising the step of:

upon said access testing by any of said plurality of testing processor nodes detecting a failure to access all of said other processor nodes, said failure detecting processor node posting a special identifier at said associated local error indicator.

4. (Original) The method of Claim 1, additionally comprising the step of:

posting an error message representing said identifier to an error log; and

subsequently accumulating said posted error messages of said plurality of processor nodes.

5. (Original) The method of Claim 2, additionally comprising the steps of:

locking said posted identifier at said error indicator for a predetermined time-out period; and

subsequent to expiration of said time-out period, deleting said posted identifier from said associated local error indicator.

6. (Original) The method of Claim 2, additionally comprising the steps of:

locking said posted identifier at said error indicator; and

responding to an operator initiated signal, deleting said posted identifier from said associated local error indicator.

7. (Original) The method of Claim 2, additionally comprising the steps of;

locking said posted identifier at said associated local error indicator; and

said displaying processor node retesting said access, and, upon absence of an error during a predetermined number of said retests, deleting said posted identifier from said associated local error indicator.

8. (Original) The method of Claim **1**, wherein said multi-drop bus network additionally comprises multiple processor nodes extending from a single drop of said multi-drop bus network, upon said access failure detecting step detecting access failure of a plurality of said multiple processor nodes at said single drop, said step of determining said processor node having failed access additionally comprises determining, from said information of relative locations, said single drop having failed access which is closest to said failure detecting processor node, and selecting one of said multiple processor nodes at said single drop, said failure detecting processor node storing an identification of said selected processor node.

9. (Original) The method of Claim **8**, wherein one of said multiple processor nodes extending from said single drop of said multi-drop bus network is identified as having a higher priority than other processor nodes extending from said single drop, and wherein said selecting step comprises selecting said multiple processor node having said higher priority.

10. (Previously Amended) A distributed processing system comprising:

a multi-drop bus network;

processor nodes coupled by said multi-drop bus network, each of a plurality of said processor nodes having information providing relative locations of said processor nodes on said multi-drop bus network; said plurality of processor nodes each independently testing access to at least one other of said processor nodes on said multi-drop bus network; upon said access

testing by any of said plurality of testing processor nodes detecting a failure to access at least one of said other said processor nodes, said failure detecting processor node determining, from said information of relative locations, the processor node having failed access which is closest to said failure detecting processor node, and storing an identification of said closest processor node having failed access.

11. (Original) The distributed processing system of Claim **10**, additionally comprising a local error indicator associated with at least one of said plurality of processor nodes, said failure detecting processor node posting, at said local error indicator associated with said failure detecting processor node, an identifier of said closest processor node having failed access.

12. (Original) The distributed processing system of Claim **11**, wherein said plurality of processor nodes, additionally, upon said access testing by any of said plurality of testing processor nodes detecting a failure to access all of said other processor nodes, said failure detecting processor node posting a special identifier at said associated local error indicator.

13. (Original) The distributed processing system of Claim **10**, wherein each of said plurality of processor nodes additionally comprises an error log, and, upon detecting said access failure, posts an error message representing said identifier to said error log.

14. (Original) The distributed processing system of Claim **11**, wherein at least one of said plurality of processor nodes additionally comprises a timer; and, upon detecting said access failure, locks said posted identifier at said associated local error indicator and starts said timer to time a predetermined time-out period; and responds to expiration of said time-out

period of said timer, deleting said posted identifier from said local error indicator.

15. (Original) The distributed processing system of Claim **11**, additionally comprising an operator input; and wherein at least one of said plurality of processor nodes, additionally, upon detecting said access failure, locks said posted identifier at said associated local error indicator; and responds to an operator initiated signal at said operator input, deleting said posted identifier from said associated local error indicator.

16. (Original) The distributed processing system of Claim **11**, wherein at least one of said plurality of processor nodes additionally, upon detecting said access failure, locks said posted identifier at said associated local error indicator; and said displaying processor node retesting said access, and, upon absence of an error during a predetermined number of said retests, deleting said posted identifier from said local error indicator.

17. (Original) The distributed processing system of Claim **10**, additionally comprising multiple ones of said processor nodes extending from a single drop of said multi-drop bus network; wherein said information of relative locations of said plurality of processor nodes, additionally provides information of said processor nodes at said single drop; wherein each said failure detecting processor node additionally, upon detecting access failure of a plurality of said multiple processor nodes at said single drop, determines from said information of relative locations, said single drop having failed accesses which is closest to said failure detecting processor node, and selects one of said multiple processor nodes at said single drop, said failure detecting processor node storing an identification of said selected processor node.

18. (Original) The distributed processing system of Claim 17, wherein one of said multiple processor nodes extending from said single drop of said multi-drop bus network is identified in said information of relative locations as having a higher priority than other processor nodes extending from said single drop; and wherein each of said plurality of processor nodes additionally, upon detecting said access failure at said single drop, determines from said information of relative locations, said higher priority processor node, and selects and stores an identification of said multiple processor node having said higher priority.

19. (Original) The distributed processing system of Claim 11, wherein said local error indicators comprise character displays of at least one character.

20. (Original) A processor node of a distributed processing system, said distributed processing system comprising processor nodes coupled by a multi-drop bus network, said processor node comprising:

an information table providing relative locations of said processor nodes on said multi-drop bus network; and

a processor independently testing access to other said processor nodes on said multi-drop bus network; upon said access testing detecting a failure to access at least one of said other processor nodes, determining, from said information table of relative locations, the processor node having failed access which is closest to said failure detecting processor node, and storing an identification of said closest processor node having failed access.

21. (Original) The processor mode of Claim **20**, additionally comprising a local error indicator associated with said processor of said failure detecting processor, said processor node posting, at said associated local error indicator, an identifier of said closest processor node having failed access.

22. (Original) The processor node of Claim **21**, additionally, upon said access testing detecting a failure to access all of said other processor nodes, said failure detecting processor node posting a special identifier at said associated local error indicator.

23. (Original) The processor node of Claim **20**, additionally comprising an error log, and wherein said processor, upon detecting said access failure, posts an error message representing said identifier to said error log.

24. (Original) The processor node of Claim **21**, additionally comprising a timer; and wherein said processor, upon detecting said access failure, locks said posted identifier at said associated local error indicator and starts said timer to time a predetermined time-out period; and responds to expiration of said time-out period of said timer, deleting said posted identifier from said associated local error indicator.

25. (Original) The processor node of Claim **21**, wherein said processor, additionally, upon detecting said access failure, locks said posted identifier at said associated local error indicator; and responds to an operator initiated signal at an operator input, deleting said posted identifier from said associated local error indicator.

26. (Original) The processor node of Claim **21**, additionally, said processor, upon detecting said access failure, locks said posted identifier at said associated local error indicator; and retests said access, and, upon absence of an error during a predetermined number of said retests, deleting said posted identifier from said associated local error indicator.

27. (Original) The processor node of Claim **20**, wherein said multi-drop bus network comprises multiple processor nodes extending from a single drop of said multi-drop bus network; wherein said information table of relative locations of said processor node additionally provides said processor nodes at said single drop; wherein said processor additionally, upon detecting access failure of a plurality of said multiple processor nodes at said single drop, determines from said information table of relative locations, said single drop having failed access which is closest to said failure detecting processor node, selects one of said multiple processor nodes at said single drop, and stores an identification of said selected processor node.

28. (Original) The processor node of Claim **27**, wherein one of said multiple processor nodes extending from said single drop of said multi-drop bus network is identified in said information table of relative locations as having a higher priority than other processor nodes extending from said single drop; and wherein said processor additionally, upon detecting said access failures at said single drop, determines from said information table of relative locations, said higher priority processor node, and selects and stores an identification of said multiple processor node having said higher priority.

29. (Original) The processor node of Claim **21**, wherein said associated local error indicator comprises a character display of at least one character.

30. (Original) A computer program product of a computer readable medium usable with a programmable computer, said computer program product having computer readable program code embodied therein for isolating failures of a multi-drop bus network in a distributed processing system, said distributed processing system comprising processor nodes coupled by said multi-drop bus network, comprising:

computer readable program code which causes a computer processor of at least one of a plurality of said processor nodes to store information of relative locations of said processor nodes on said multi-drop bus network;

computer readable program code which causes said computer processor to test, independently of other of said processor nodes, access to at least one other of said processor nodes on said multi-drop bus network;

computer readable program code which causes said computer processor, upon said access testing detecting a failure to access at least one of said other processor nodes, to determine, from said provided information of relative locations, the processor node having failed access which is closest to said failure detecting processor node; and

computer readable program code which causes said computer processor to store an identification of said closest processor node having failed access.

31. (Original) The computer program product of Claim 30, additionally comprising computer readable program code which causes said computer processor to post, at a local error indicator associated with said failure detecting processor node, an identifier of said closest processor node having failed access.

32. (Original) The computer program product of Claim 31, additionally comprising computer readable program code which causes said computer processor, upon said access testing detecting a failure to access all of said other processor nodes, to post a special identifier at said associated local error indicator.

33. (Previously Amended) The computer program product of Claim 30, additionally comprising computer readable program code which causes said computer processor to provide an error log, and which causes said computer processor, upon detecting said access failure, to post an error message representing said identifier to said error log.

34. (Original) The computer program product of Claim 31, additionally comprising computer readable program code which causes said computer processor to provide a timer, and which causes said computer processor, upon detecting said access failure, to lock said posted identifier at said associated local error indicator and start said timer to time a predetermined time-out period, and to respond to expiration of said time-out period of said timer, deleting said posted identifier from said associated local error indicator.

35. (Original) The computer program product of Claim 31, wherein said computer readable program code additionally causes said computer processor, upon detecting said access failure, to lock said posted identifier at said associated local error indicator, and to respond to an operator initiated signal at an operator input, deleting said posted identifier from said associated local error indicator.

36. (Original) The computer program product of Claim **31**, wherein said computer readable program code additionally causes said computer processor, upon detecting said access failure, to lock said posted identifier at said associated local error indicator, and to retest said access, and upon absence of an error during a predetermined number of said retests, to delete said posted identifier from said associated local error indicator.

37. (Original) The computer program product of Claim **30**, wherein said multi-drop bus network comprises multiple processor nodes extending from a single drop of said multi-drop bus network; and wherein said computer readable program code additionally causes said computer processor to provide said information of relative locations of said processor nodes to additionally provide information of said processor nodes at said single drop; and wherein said computer readable program code additionally causes said computer processor, upon detecting access failure of a plurality of said multiple processor nodes at said single drop, to determine from said information of relative locations, said single drop having failed access which is closest to said failure detecting processor node, to select one of said multiple processor nodes at said single drop, and to store an identification of said selected processor node.

38. (Original) The computer program product of Claim **37**, wherein said computer readable program code additionally causes said computer processor to identify, in said provided information of relative locations, one of said multiple processor nodes extending from said single drop of said multi-drop bus network as having a higher priority than other processor nodes extending from said single drop; and wherein said computer readable program code additionally causes said computer processor, upon detecting

said access failures at said single drop, to determine from said information of relative locations, said higher priority processor node, and to select an identification of said multiple processor node having said higher priority.

39. (Original) An automated data storage library having a distributed control system, said automated data storage library accessing data storage cartridges in response to received commands, comprising:

a multi-drop bus network;

at least one communication processor node for receiving commands, and coupled to said multi-drop bus network to provide a communication link for said commands;

a robot accessor having a gripper and servo motors for accessing said data storage cartridges, said robot accessor having at least one processor node coupled to said multi-drop bus network for operating said gripper and said servo motors in response to said linked commands;

each of said processor nodes having information of relative locations of processor nodes on said multi-drop bus network; said processor nodes each independently testing access to other said processor nodes on said multi-drop bus network; upon said access testing by any of said testing processor nodes detecting a failure to access at least one of said other processor nodes, said failure detecting processor node determining, from said information of relative locations, the processor node having failed access which is closest to said failure detecting processor node; and said failure detecting processor node storing an identification of said closest processor node having failed access.

40. (Original) The automated data storage library of Claim 39, additionally comprising a plurality of local error indicators, each uniquely associated with at least one of said processor nodes, and wherein said failure detecting processor node additionally posts, at said local error indicator associated with said failure detecting processor node, an identification of said closest processor node having failed access.

41. (Original) The automated data storage library of Claim 40, wherein said processor nodes, additionally, upon said access testing by any of said testing processor nodes detecting a failure to access all of said other processor nodes, said failure detecting processor node posting a special identifier at said associated local error indicator.

42. (Original) The automated data storage library of Claim 39, wherein each of said processor nodes additionally comprises an error log, and, upon detecting said access failure, posts an error message representing said identifier to said error log.

43. (Original) The automated data storage library of Claim 40, wherein at least one of said processor nodes additionally comprises a timer; and, upon detecting said access failure, locks said posted identifier at said associated local error indicator and starts said timer to time a predetermined time-out period; and responds to expiration of said time-out period of said timer, deleting said posted identifier from said associated local error indicator.

44. (Original) The automated data storage library of Claim **40**, additionally comprising an operator panel comprising an operator panel processor node and an operator input; and wherein at least one of said processor nodes, additionally, upon detecting said access failure, locks said posted identifier at said associated local error indicator; and responds to an operator initiated signal at said operator input, deleting said posted identifier from said associated local error indicator.

45. (Original) The automated data storage library of Claim **40**, wherein at least one of said processor nodes additionally, upon detecting said access failure, locks said posted identifier at said associated local error indicator; and said displaying processor node retesting said access, and, upon absence of an error during a predetermined number of said retests, deleting said posted identifier from said associated local error indicator.

46. (Original) The automated data storage library of Claim **39**, additionally comprising multiple ones of said processor nodes extending from a single drop of said multi-drop bus network; wherein said provided information of relative locations of said plurality of processor nodes additionally determining said processor nodes at said single drop; wherein each of said processor nodes additionally, upon detecting access failure of a plurality of said multiple processor nodes at said single drop, determines from said information of relative locations, said single drop having failed access which is closest to said failure detecting processor node, and selects one of said multiple processor nodes at said single drop, said failure detecting processor node storing an identification of said selected processor node.

47. (Original) The automated data storage library of Claim **46**, wherein one of said multiple processor nodes extending from said single drop of said multi-drop bus network is identified in said provided information of relative locations as having a higher priority than other processor nodes extending from said single drop; and wherein each of said plurality of processor nodes additionally, upon detecting said access failures at said single drop, determines from said information of relative locations, said higher priority processor node, and selects and stores an identification of said multiple processor node having said higher priority.

48. (Original) The automated data storage library of Claim **40**, wherein said local error indicators comprise character displays of at least one character.

49. (Original) The automated data storage library of Claim **39**, additionally comprising a plurality of interconnected frames, each having a plurality of said storage shelves, at least one of said frames coupling said at least one robot accessor processor node with said multi-drop bus network, at least one of said frames coupling said at least one communication processor node with said multi-drop bus network, said processor nodes in each of said frame comprising at least one said relative location.